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Food Preferences of the Black Cricket (Gryllus assimilis) with Special Reference to the Damage Done to Fabrics (Orthop.).

By MARGARET B. SAVIN, Philadelphia, Pennsylvania.

(Continued from page 10.)

Table I is a summary of a fuller table copies of which are deposited with the Graduate School, University of Pennsylvania, and with the American Entomological Society. It will give some idea of the time required for consuming certain raw and cooked vegetables and the age and sex of the subjects used. If the food was not touched a blank space is left.

TABLE I.

Food.	Crickets Tested.	Time in hours required for consuming food.
Tomato (raw, pyramid 10 mm., 1-16 mm. thick)	4 ♀ nymphs	.75 to 12.
	1 ♂ adult, 1 ♂ nymph	
Potato (raw, 1 x 3 x 3 mm.)	7 ♀ nymphs	.75 to 34.
	6 ♂ nymphs	.75 to 17.5
Carrot (raw, pyramid 10 mm., 1-16 mm. thick)	3 ♀ nymphs	1.25 to 28.
	1 ♂ adult, 1 ♂ nymph	
	2 ♂ nymphs	37. and 58.
	4 ♀ nymphs	5.3 to 48.
Lima Bean (raw, 10 mm. in diameter)	4 ♀ adults	8.25 to 48.
	3 ♂ nymphs	24. to 32.
	4 ♂ adults	8.5
	2 ♀ nymphs	23.5
Lima Bean (cooked, 10 mm. in diameter)	1 ♀ molting	96.
	3 ♂ nymphs	23.5 to 63.
	2 ♂ adults	63. and 96.
Corn (raw, 1 kernel)	1 ♀ nymph	6.
	5 ♀ adults	24.
	1 ♂ nymph	5.5
	3 ♂ adults	24. to 26.
Corn (cooked, 1 kernel)	3 ♀ nymphs	5. to 24.
	7 ♂ nymphs	9.5 to 24.
	3 ♂ molting	

Some interesting feeding habits were observed, such as the eschewing of the skin of the tomato and peach and of the hilum of the bean. The skin of the corn kernel was eaten last, all of the part within having been gouged out. Each of two individuals was given a whole lima bean pod. Both crawled up to the top of the pod and began eating at the stem end, working back. No attempt was made to secure the beans until they were reached in the course of feeding. It required eight days to consume the entire pod. This behavior is contrary to that reported of crickets in alfalfa fields (Severin 1920). We read: "When the pest has opened up the seed pod, it pulls out the developing seed and devours it."

A small nymph caught in a basket of corn was confined with a corn ear worm. Both continued to be lively for six days when the caterpillar went into a chrysalis and the cricket molted. Two days later, the nymph had eaten one-half of the pupa. Several writers (Bintner 1891, Chittenden 1896, Criddle 1925) have recorded the cannibalistic tendency of *Gryllus* and its liking for animal matter; Criddle reared his first nymphs on tabanid flies alone. My observations bear this out very decidedly. Nine adults were given three fresh killed house flies apiece. These were devoured in an average time of eighteen minutes.

Two of the confined specimens for some unknown reason chewed off and ate their own hind legs, first one and then the other. To my knowledge, they had not been injured nor were they hungry. Both continued to live for ten days until I chloroformed them.

We discovered in a closet, an all-rubber bathing cap trimmed with blue and white rubber flowers, which had many small holes chewed in it. As the damage could have been laid to a mouse, I put an unharmed rubber flower in each of the glasses of three adult crickets. Immediately they began to bite into the rubber and continued working for three hours. Most of the chewed bits were actually taken into the body, although there were some fragments lying on the bottom of the glass. I repeated this experiment with several other specimens and found that there is no question of the liking for rubber.

Lintner in 1891 reported that crickets will "gnaw holes into boots and shoes." We found a new leather traveling bag much scarred, the black grain and finish having been entirely chewed off. Though I did not attempt a proof of the cricket's guilt, I do not doubt that it was responsible for the damage to the leather.

Some magazine pictures which had been pasted in an upper room on the brick fireplace chimney were much chewed, at the corners especially. This observation suggested that *Gryllus* will eat paper and paste. I put on one glass a piece of American bond paper with well-dried paste in the center, and in another glass paper with fresh moist paste in the center. The paper was finally eaten on the edges where no paste had been put, but apparently not used for food, as many tiny bits of paper lay scattered on the bottom of the glass.

Many references to the economic status of *Gryllus* mention the case first quoted by Lintner (1893) of the damage done by crickets to a new suit, belonging to a friend of Mr. Wm. B. Marshall, of the New York State Museum, when he was visiting at Cape May.

From conversation with those who frequently sojourn in the less built up parts of seashore resorts, from state agricultural bulletins, and references of entomologists (Herrick 1914, Felt 1909, Lutz 1921, Criddle 1925) and from my own experience, I know that the field cricket does cause damage to clothing, particularly to woolens. This habit has been observed in *Gryllus domesticus* also (Morse 1922, Surface 1913, Lugger 1896.) It was my intention to determine why the crickets turn their attention away from their normal vegetable diet to cloth materials.

Lintner proposed that "clothing long worn and charged with animal matter from person and from extraneous sources might naturally be supposed to attract crickets that have acquired the taste indicated above." The reference is to the flesh of putrid birds. From the results I obtained with house flies offered as food, this taste seems to me to be well established and certainly not acquired since my experiments began.

As I had always suspected that spots of grease or food on

clothing would attract, I placed in some glasses clean pieces of new, navy blue, woolen suiting, and in others pieces of the same spotted with bacon grease or with lemonade or sweetened peach juice. After a time, the cloth was chewed in holes of no regular size or shape. However, in almost every case, the areas eaten were not those which had been spotted. Most pieces were damaged only on the edge and but one or two were actually cut on the spotted portion.

I used pieces of old suiting soiled with perspiration. This was attacked in the same manner. No discrimination on the part of the feeders was evidenced. They did not begin at once to bite the cloth, but only after a day or more had passed and no other food had been offered. The average time required before the cloth was first damaged was forty-four hours for all kinds and conditions of woolen material. I believe that this coincidence means nothing, however, as the number of cases used was too few.

The results given in the following table for woolen fabrics show that the time elapsing before the first damage to the material, varies greatly with different individuals.

TABLE II.

Food	Sex and	Individual number of Cricket	Time in hours elapsing before first damage	Nymph or Adult
Suiting (wool, old—spotted	♀	7	24.	Nymph
	♂	30	120.	Nymph
	♀	35	.08	Adult
Broadcloth (new)	♂	11	71.	Adult
Suiting (new)	♀	34	56.	Adult
	♀	36	24.	Adult
	♀	40	27.	Adult
Suiting (wool, new—spotted)	♂	18	24.	Adult
	♂	19	71.	Adult
	♂	22	144.	Adult
	♀	31	72.	Adult
	♀	34	.16	Adult
	♀	35	23.	Adult
	♀	41	27.	Nymph
	♂	72	27.	Adult
	♀	46	.16	Adult

One specimen did show great avidity for cloth. It was a cricket caught late at night on the bedroom floor and put in a glass containing one inch-and-one-half square of henna collored broadcloth, soaked some twelve hours before with sweetened peach juice. On the following morning, the square inch of cloth was in unrecognizable form. It had been chewed into three larger pieces and innumerable smaller ones.

Lugger, in a Minnesota Agricultural Bulletin, stated in 1896, that "house crickets cause damage by eating clothes, especially if these are wet." This statement I was unable to prove. In fact the cloth tested frequently became wet when the water was given to the cricket each day, but the saturated condition did not seem to hasten the damage.

As I expected, my experiments show a decided preference on the part of *Gryllus* for materials of wool. In a drawer of the kitchen cabinet where towels were kept, I found a clean but old cotton net curtain folded many times and riddled with holes, made through several thicknesses of material. I put a whole piece of curtain, three times folded, in with one of the specimens. It was quickly chewed in several good-sized holes. All other pieces of cotton materials were untouched. Pink and white linen, tan and pink silk and colored voile were placed in the glasses of a number of individuals. Some of these were sampled, as could be seen by a very slight nick on one edge, but no real damage was done.

Though experiments with linen were unsuccessful, I found as I was packing a green linen dress to return home, that a large circular hole had been made in it. This was undoubtedly the work of a cricket. So many of my daily results were like this. The subjects did not adhere to any one method or habit and seemed almost temperamental.

Table III shows *average* times required for consuming foods. The averages cited for fabrics refer to the amount of time elapsing before the first damage was done. Unfortunately the number of subjects (crickets) used for various food varies considerably.

TABLE III.

Food	Average Time	Longest Time	Shortest Time	No. of Subjects	Nymph Average	Adult Average	Male Average	Female Average
Tomato (raw).....	6.	12.	1.3	4				
Potato (raw).....	6.	34.	3.	11			4.7	16.4
Carrot (raw).....	25.9	58.	1.25	5			47.	11.5
Lima Bean (raw)...	20.5	53.	8.5	14	32.7	8.4	16.2	26.
Lima Bean (cooked).	50.1	96.	23.5	9	41.7	79.	51.4	47.6
Corn (cooked).....	13.8	24.	5.	9	13.8		15.3	12.8
Corn (raw).....	5.5	6.	5.5	2				
Cloth (new).....	44.	71.	24.	4				
Cloth (old spot).....	44.	120.	.8	3				
Cloth (new spot)....	44.	144.	.16	9				
3 flies	.3	.66	.10	9		.3		

Undoubtedly crickets prefer raw and cooked vegetable food to woolen and cotton fabrics. The cause of attacking the latter I do not yet understand. Whether they are actuated by hunger or by a desire to escape from under a fold in a garment, I do not know and very much doubt. "Pure wantonness" as one worker (Chittenden 1896) has put it, seems to be the best explanation, although it does evade the question.

The peculiar attraction to rubber as a food and their eagerness in eating it made me think as I watched them, that they preferred it to the most favored vegetables. The explanation of this fact is still a question in my mind.

Forty-two different types of food were offered to one or more of the fifty crickets used in experimentation. I cannot say that crickets will refuse to try any article on this list from vegetables to rubber. Scarcely will two individuals require the same amount of time for eating, nor will they go about the task in the same way. A better demonstration of temperamentalism, if they could be guilty of such a trait, one could not find. With Lutz and Criddle, I agree upon the title "Omnivorous Gryllus."

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An Aberrant Specimen of Necrophorus tomentosus (Weber) (Coleop.: Silphidae).

Recent investigations have obliged me to collect numbers of *Necrophorus* beetles of various species. About midnight of July 8, a specimen of *N. tomentosus* was taken on a piece of slightly old meat in a pile of bricks in my own yard at Elgin, Illinois, the right elytron of which is marked as follows:

The sub-basal and sub-apical spots are united by a band of the same color. This band is approximately 2mm. wide, and covers the median half of the elytron. It is narrower by about ½mm. at the point where it fuses with the sub-apical spot than it is where it joins the sub-basal. Thus, instead of the usual black between the spots, extending in an uninterrupted band from the outer to the inner margin of the elytron, only a black spot approximately 2x2mm. extends from the outer margin to the middle of the elytron.

Careful examination revealed no other abnormalities in coloring or in external structure. Although I have had much experience with various species of *Necrophorus* for many years, I have never before found an aberrant specimen, nor noticed any discussion of such in the journals. I should be pleased to hear from any one who has found such a specimen.

Cyril E. Abbott, Dept. of Zoology,
Johns Hopkins University, Baltimore, Md.

Note on the Collecting of Say's Mulatto-Bug (Cydnoides albipennis Say) (Hemiptera, Cydnidae).*

By HARRY H. KNIGHT, Ames, Iowa.

While on a collecting trip in Colorado during August, 1925, the writer along with Dr. C. J. Drake, collected several specimens of an interesting bug belonging to the family Cydnidae. Because of its remarkable color pattern, which we had not seen elsewhere in collections, we knew at once that our find represented at least a rare or little-known species. Members of the family Cydnidae are commonly called negro-bugs, apparently since a majority of them are deep black in color. The bug we collected has the large scutellum and basal area of pronotum reddish brown, head and part of pronotum black, with lateral margin of pronotum and the chitinized part of the wing white, except for a small brownish spot near apex of corium. The color combination of this bug suggests on first casual glance a Coccinellid beetle rather than a Cydnid. Because of this illusion I have a recollection of allowing the first specimen to escape, since in my net Coccinellids did not take precedence over Hemiptera.

The writer took nine female specimens while Dr. Drake collected eight others, August 4, 1925, along the main automobile road about three miles north of Wray, Colorado. These specimens were taken by sweeping sedges found growing along the course of a small spring fed stream which arises on the west side of the road, passes under a bridge and flows southeast. We were at a point where the first low foot hills rise from the great plains of eastern Colorado.

After looking up the literature I find this insect was first described as *Thyreocoris albipennis* by Thomas Say (Descrip. N. Sps. Heter. Hemip. N. A., p. 2, 1831). It was next mentioned in the year 1876, when Uhler (Bul. U. S. Geol. Geog. Surv., I, p. 271) quotes the original description of *albipennis* Say and remarks:

"Obtained by Mr. Say in Nebraska near the Missouri River.

*Contribution from the Department of Zoology and Entomology, Iowa State College, Ames, Iowa.

The specimen described by Mr. Say was a mutilated one, without a head. The description is copied here with a view to call the attention of collectors to this remarkable insect, and to enlist those who are favorably situated to endeavor to recover it for the advancement of our knowledge in this branch of modern science."

The rediscovery of the species is recorded by Professor Herbert Osborn (Ent. News, IV, p. 91, 1893) in which he states:

"In a collection of Colorado Hemiptera which I have recently had the pleasure of examining for Prof. C. P. Gillette, of Fort Collins, Colorado, I found a specimen which agrees in every particular with Say's description. I can have no hesitation in referring it to his species, and considering it a very well marked and distinct species. Say described it under the name of *Thyreocoris albipennis,* but it should be referred to *Corimelaena."*

The following year, Prof. Osborn (Proc. Ia. Acad. Sci., I, pt. 4, p. 121, 1894) again recorded the same specimen.

Van Duzee (Trans. Am. Ent. Soc., xxx, 1904) changes the name of *albipennis* Say to *Corimelaena Sayi* since that name is preoccupied in the genus *Corimelaena* by *C. albipennis* Eschscholtz (1822). He also gives a redescription of the species based upon two specimens which were recognized in the collection of the Colorado Agricultural College at Fort Collins, having been collected in the foot hills about thirty miles northwest of Fort Collins. Van Duzee remarks that: "These individuals and another sent by Prof. Gillette to Prof. Herbert Osborn and recorded by him (1893 and 1894), are, so far as I can learn the only known specimens.

It remained for Zimmer (Univ. Neb. Studies, xi, 1912, p. 247) to report the finding of a large series of specimens when he states:

"Very little is known concerning the habits or distribution of this insect owing to its apparent rarity. Say described it in 1831 from a specimen, lacking a head, collected in 'Missouri . . . on the Missouri river.' The exact locality is indeterminable, but there is a probability that the place was somewhere within the present limits of Nebraska. Since that time, two specimens have been collected at Fort Collins, Colorado, and the occurrence recorded. Another individual, thought to be of this species, was recorded from the same locality but was

later found to be the immature form of *renormata* Uhler. Aside from these specimens no others have come to light. For some time there has been a specimen in the collection, taken at Halsey, Nebraska. On August 25, 1911, when I was collecting at that locality, Mr. A. G. Vestal, who was with me, called my attention to a bug which he had picked up. I found it to be an individual of the present species and search revealed the presence of such an abundance of others that I was able to secure a hundred or more in a comparatively short time. The habitat of the species here was a sandy stretch of ground, occupied by a prairie-dog town and covered with typical Nebraska sandhill vegetation, including among the plants *Euphorbia geyeri*. This plant, growing flat on the ground and spreading out rather broadly, sheltered the insects, which were found, sometimes a dozen or more at a time, under the prostrate stems and leaves. The same plant grew higher up on the hills and in the blow-outs, and I found the bug once in such a location on September 2, when I collected a dozen or more. On September 15, at Crawford, Nebraska, I collected another specimen in a canyon of the pine ridge near the canyon's mouth, although I did not take it from the *Euphorbia*, and at Halsey, again, on the 23d of the same month I found it still abundant, although after a heavy frost."

We next find mention of this insect by Malloch (Ill. Nat. Hist. Surv. Bull., xiii, p. 209, 1919) when he describes the new genus *Cydnoides*, and includes four species, of which one is *sayi* (Van. D.). Knowing of the rarity of this species, Malloch states: "I take this opportunity to extend its hitherto known range by recording the collection of three fine female specimens of *sayi* at Fort Brown, Brownsville, Texas, November 29, and December 9, 1910, by Mr. Hart."

More recently, Van Duzee (Ent. News, xxxiv, p, 305, 1923) gives a re-arrangement of the species of Thyreocorinae and lists *Cydnoides albipennis* (Say) as the correct name for the species. After looking up the literature I find that *Scutellera albipennis* Eschscholtz (Entomographien, 1822, p. 159, *also* Dorpat. Naturw. Abhandl., I, 1823, p. 159) described from Chili, still remains in the genus *Corimelaena*, thus *albipennis* Say is not preoccupied in the genus *Cydnoides* and the name can be revived.

Such is the known history of Say's mulatto-bug.

Synopsis of the Syrphid Genus Copestylum Macq. (Diptera.)*

By C. H. CURRAN, Ottawa, Ontario.

In ENTOMOLOGICAL NEWS, volume 21, pp. 222-25, 1910, Dr. J. M. Aldrich published a valuable review of this genus, but did not make any attempt to interpret the Townsend species in relation to those already described. However, he had examined the types of the species described by Townsend, which were in the California Academy of Science and determined that several of the species placed in the genus *Volucella* by Townsend actually belonged to *Copestylum*. While at Kansas University several years ago I discovered the type of *Volucella inops* Townsend and found that it was the same as *Copestylum marginatum* Say.

From Townsend's descriptions the only conclusions which can be drawn are that all but one are absolutely synonyms of *Copestylum marginatum* Say, while the remaining species is undoubtedly the same as *C. limbipennis* Williston. The descriptions of the five species listed here as synonyms of *marginatum* show very little difference of importance, and much more striking color variations are obtainable in large series. The species herein described as new does not agree with any published descriptions, although it has long been confused with *marginatum*. It remains to be seen whether *C. simile* Giglio-Tos is distinct from *marginatum*, but until series of this form are available it will not be possible to decide this question.

Table of Species.

1. Fourth abdominal segment clothed with abundant erect pale pile, sometimes with coarser black hairs intermixed 2
   Fourth abdominal segment clothed with sparse, coarse, somewhat flattened, sub-appressed whitish hair. *caudatum* n. sp.
2. Wings at most a little darkened; with a blackish spot at base of stigma and along the anterior crossvein... 3
   Subapical half of the wing brown in front of the third vein ..... *limbipennis* Will.

*Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agriculture, Ottawa.

3. Fourth abdominal segment without black hairs; scutellum broadly pale haired on the border.....4
   Fourth abdominal segment with longer coarse black hairs intermixed with the pale ones on much of the surface; venter wholly black (in ♀?)....*lentum* Will.
4. Venter black, with the narrow lateral border pale; legs black except the bases of the tarsi....*simile* G.-T.
   Venter with the second and third segments yellowish, the second sometimes mostly black...*marginatum* Say.

Copestylum limbipennis Williston.

Synopsis N. Amer. Syrphidae, 152, 1886.
Volucella lucasana Townsend, Pr. Calif. Acad. Sci., iv, 615, 1894. (Apr. 1895).

Readily recognized by the color of the wings. There is a specimen before me from Mission, Texas, Dec. 5, 1910. Townsend's description agrees quite well.

Copestylum simile Giglio-Tos.

Boll. R. Univ. Torino, vii, No. 123, p. 2, 1892.
Copestylum parvum Giglio-Tos, Boll. R. Univ. Torino, vii, No. 123, p. 2, 1892.

Giglio-Tos, in his *Ditteri del Messico,* expresses doubt about these two forms representing different species. The differences indicated in the descriptions appear to be insufficient to retain them as distinct species.

Copestylum marginatum Say.

Volucella marginata Say, Journ. Acad. Nat. Sci., Phila., vi, 167, 1829. (Mexico).
?*Copestylum flaviventris* Macquart, Dipt. Exot., suppl. i, 125, 1846. (Colombia).
Copestylum distinctum Giglio-Tos, Ditteri del Messico, i, 41, 1892 (Mexico.)
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Volucella fax Townsend, Trans. Amer. Ent. Soc., xxii, 42, 1895. (Colo.)
Volucella inops Townsend. Trans. Amer. Ent. Soc., xxii, 43, 1895. (Colo.)
Volucella toltec Townsend, Trans. Amer. Ent. Soc., xxii, 45, 1895. (Mexico). (*tolteca* Aldrich).

The types of the species described by Townsend from Lower California were examined by Dr. Aldrich shortly before they were destroyed, but in his discussion of them no indication of synonymy was given. The type of *inops* I have seen and it is quite evidently the same as *marginatum*. In other cases the descriptions leave little doubt as to the synonymy. *C. distinctum* G.-T. is only a variety of *marginatum*, there being many intermediate forms.

Copestylum lentum Williston.

Copestylum marginatum lentum Williston, Syn. N. Amer. Syrphidae, 152, 1886.

I consider this to be quite distinct from *marginatum* as the scutellum bears all black hairs while in *marginatum* the disc bears short black hair and the border longer pale pile. In the specimen of *lentum* before me the thorax is all black-haired except laterally in front of the suture and above the anterior coxae, where shorter, fine, crinkly, pale pile is quite evident. Abdominal venter wholly black, at least in the male.

Copestylum caudatum new species.

Distinguished from the remaining species in the genus by the sparse, coarse, somewhat flattened hairs on the fourth abdominal segment and sides of the others. Length, 7 to 8 mm.

♂.—Face bleached yellowish, a rather broad median vitta, a very broad stripe separating the face and cheeks, the cheeks except an anterior stripe and spot at the posterior corner of the eyes, and the front, except a large orbital spot on either side, shining black; the black color covers the whole of the antennal tubercle. Vertical triangle and occiput black, the posterior orbits broadly grayish pollinose. Pile cinereous, a broad band of black pile on the eyes in front. Antennae reddish brown to brownish red, the third segment narrowed on the apical fourth; arista black, densely short haired above and on the lower edge except basally.

Thorax shining black, the lateral margins of the mesonotum, a pair of oval longitudinal prescutellar spots and the scutellum, translucent reddish yellow. Pile wholly cinerous, fine. A large reddish spot on the mesopleura above.

Legs black; apices of femora and basal third to half of the tibiae, yellow; apices of the anterior four tibiae, more or less broadly, and the first three segments of all the tarsi, reddish.

Hair black except on the anterior basal third of the middle tibiae.

Wings hyaline, the veins mostly yellowish; a black spot at the base of the stigma and along the anterior crossvein. Squamae and fringe white, the rim yellowish tinged. Halteres whitish yellow.

Abdomen shining black, the second segment with a pair of moderately large lateral triangles which are slightly concave in front, slightly oblique behind, almost touch the base of the segment laterally and are broadly separated from the posterior margin, the spots separated from each other by more than one-third the width of the segment. Third segment with a pair of large, basal yellowish spots which are narrowed towards either end, the ends rounded, separated more or less broadly from the lateral margins and narrowly so from each other. Fourth segment with obscure reddish tinge towards either side basally. Pile very short on the disc, longer, sparse, whitish laterally and on the fourth segment, more or less flattened and rather coarse; on the second and third segments the hair is black behind the pale spots and between them except basally, elsewhere whitish. Venter black, the incisure between the second and third sternites broadly reddish, the sides of the basal sternites very narrowly reddish; pile cinereous, long, black on the apices of the terminal sternites.

♀.—Cheeks reddish yellow with a brown stripe across the middle; the yellow of the face extends broadly to above the middle of the front along the orbits and is joined inwardly to an oval spot on either side below the middle; vertex, produced triangularly to the neck, yellow. Pale markings of the thorax yellowish. Abdomen much more extensively pale, the black markings mostly replaced by ferruginous, the second segment yellow on the basal two-thirds or three-fourths, the pale spots on the third segment occupying two-thirds the length of the segment, subrectangular, the spots on the fourth segment similar but rounded posteriorly on the inner border, the apex of the segment pale yellow. Second and third sternites yellowish, a narrow median vitta and most of the third segment rusty reddish.

Holotype, ♂, Medicine Hat, Alberta, May 8, 1926, (F. S. Carr). No. 2304 in the Canadian National Collection, Ottawa. *Allotype*, ♀, Oak Creek Canyon, Arizona, (F. H. Snow). *Paratypes:* ♂, same data as holotype; 2♂, Jemez Springs, New Mexico.

The allotype is evidently an unusually pale specimen.

The Automobile vs. Insects.

By A. O. LARSON, U. S. Bureau of Entomology

Dr. Howard (1) says that "every man who studies insects and who records his results is doing greatly needed work and work that sooner or later will help to lead to a close understanding of insect life which may bring about its control by man." Whether one observes the insects and their activities, or the agencies which aid or hinder their ever-increasing spread and multiplication, such observations can be beneficial only after they are made available to others.

In this paper the writer purposes to show that the automobile not only acts as a carrier of insects, thereby aiding the insects to establish themselves in new sections, but also in at least the following four ways, performs noteworthy service in reducing the number of insects with which man has to contend:

1. It aids in keeping down the number of house flies by reducing or making inaccessible the quantity of pabulum necessary for the fly larvæ.
2. In some sections it greatly aids in the control of certain species of mosquitoes, by means of the oil drippings, including garage wastes, which enter the drainage systems and there serve as efficient larvacides.
3. By filling hedge rows with dust and debris, it destroys the favorite breeding places of certain insects thereby reducing their numbers.
4. It destroys immense numbers of insects by running over and crushing those on the highways and by striking against others in flight.

The automobile has long been recognized as an important factor in the distribution of insects from one section to another. Titus (2) in 1910 recognized it as one of the means by which the alfalfa weevil was carried into uninfested areas, and it has frequently been mentioned as an important factor in the distribution of the Japanese beetle, the European corn borer, the gipsy and brown-tail moths (1), the melon fly (3), the Mediterranean fruit fly, the cotton boll weevil, and other important insects.

Because of the recognized importance of the automobile as

an insect carrier, certain states have instituted automobile inspection on the principal highways leading from certain insect-infested areas. The importance of this inspection in California is emphasized by the variety of insects taken at the northern border stations during the past season (1925). A list of these follows:

Name of Insect	Number of Specimens	Number of Autos carrying Insects	Name of Insect	Number of Specimens	Number of Autos carrying Insects
Agonoderus sp.	1	1	Ceratomegilla vittigera	3	2
Allograpta sp.	1	1	Chalcid	2	2
Amara sp.	10	8	Chilocorus bivulnerus	2	2
Anatis sp.	1	1	Chlorochroa congrua	1	1
Anelastes sp.	3	3	Chrysobothris sp.	1	1
Ant lion larvae	2	2	Chrysomelid (undetermined)	3	3
Anthicid	1	1	Chrysomphalus aurantii	1	1
Anthonomus sp.	1	1	Chrysopid larva	1	1
Aphodius sp.	3	3	Cicadellid (undetermined)	1	1
Aradus	11	7	Cimex lectularius	54	3
Aradus lugubris	6	5	Cistela opaca	1	1
Ataenius abditus	1	1	Cleonus sp.	1	1
Attagenus piceus	1	1	Clerus sp.	1	1
Bembidium sp.	2	2	Coccinellid (undetermined)	10	8
Berytid (undetermined)	4	4	Coleoptera (undetermined)	42	18
Blapstinus sp.	5	4	Collops sp.	1	1
Brachyrhinus ovatus	26	18	Coniontis sp.	5	4
Bruchid	1	1	Coreid (undetermined)	1	1
Bruchus quadrimaculatus	7	1	Corizus sp.	1	1
Caddice fly	1	1	Corimelaenid	1	1
Calathus sp.	7	3	Cydnid (undetermined)	1	1
Calosoma	1	1			
Camponotus	1	1			
Cardiophorus sp.	1	1			
Carabid (undetermined)	3	3			
Centipede	1	1			
Cerambycid	3	3			

*This list was kindly furnished by Mr. A. C. Fleury, Supervising quarantine officer of the California Department of Agriculture.

Name of Insect	Number of Specimens	Number of Autos carrying Insects
Dendroctonus sp. ..	1	1
Dendroctonus valens	1	1
Dermacentor sp. ..	3	3
Dermestes vulpinus	2	2
Dermestid larvae ..	4	4
Diachus sp.	1	1
Dorytomus sp.	43	13
Dorytomus cuneatulus	1	1
Dorytomus inaequalis	123	38
Drosophilids	2	1
Elaterid larvae ...	3	3
Eleodes sp.	5	5
Eleodes tricostata .	3	3
Ephestia sp.	27	1
Epicauta maculata.	1	1
Eusattus dubius ...	1	1
Formica	1	1
Geocoris sp.	16	11
Gyrinid	3	1
Haltica	3	3
Harpalus sp.	1	1
Heliothis obsoleta larvae	3	3
Hesperiid	1	1
Hemipterous nymphs	11	9
Hippodamia sp. ...	1	1
Hippodamia crotchii	2	2
Hippodamia convergens	2	2
Hippodamia 5-signata	1	1
Hippodamia parenthesis	1	1
Hister sp.	2	2
Hoplia callipyge ..	5	5
Hydnocera sp.	1	1
Hymenorus sp. ...	6	6
Hypera postica	3246	529
Hypera punctata ..	1	1
Jassid (undetermined) .	2	2
Lepidopterous larvae	70	53
Lepidosaphes beckii	1	1
Luperodes varipes.	1	1
Lygus sp.	2	2
Lygaeus kalmii ...	1	1
Lygaeus reclivatus.	1	1
Lygus pratensis ...	19	9
Magdalis sp.	1	1
Machilid (undetermined) .	2	2
Malachiid	1	1
Membracid (undetermined) .	2	2
Metachroma sp. ...	1	1
Metachroma californicum	13	1
Metoponium faustum	2	1
Mirid (undetermined) .	10	6
Moths (undetermined) .	7	5
Monoxia sp.	3	3
Notoxus sp.	4	3
Noctuid larva	1	1
Notonectid (undetermined) .	1	1
Nyctoporis sp.	1	1
Nysius ericae	7	4
Pentatomid	1	1
Periplaneta sp.	1	1
Perla	1	1
Phaedon sp.	30	4
Phalangiid	3	3
Porcellio sp.	1	1
Pristoscelis	2	2
Pseudoscorpion ...	1	1
Pterostichus sp. ...	3	3

Name of Insect	Number of Specimens	Number of Autos carrying Insects
Reduviid (undetermined)	3	3
Saprinus sp.	1	1
Saprinus lugens	3	3
Sawfly larva	1	1
Scarabaeid	2	2
Scatophaga sp.	2	1
Scorpion	5	5
Serica sp.	3	2
Sitones sp.	4	2
Sitones hispidulus	6	5
Silpha sp.	4	4
Snout beetle (undetermined)	8	4
Sphenophorus vomerinus	3	3
Solpugid	4	4
Spondylis eupiformis	1	1
Springtail	1	1
Staphylinid	2	2
Stenochidus carbonarius	1	1
Tenebrioides mauritanicus	3	3
Tenebrionid (undetermined)	8	7
Trichodes sp.	2	2
Trirhabda sp.	2	2
Tribolium confusum	1	1
Triatoma protractus	1	1

The above list emphasizes the danger of injurious insects being transported into a state where agriculture is of such tremendous importance, and where the establishment of pests would be so disastrous. The magnitude of the task of keeping out one of these, the alfalfa weevil, *Hypera postica*, is shown by A. C. Fleury in a letter dated December 15, 1925, in which he says:

"During the first eleven months of the year 1925 there have been inspected 118,286 automobiles. At the northern stations, all automobiles entering California are stopped and those carrying camping equipment are required to unload for inspection. All tents, blankets and other equipment are thoroughly examined and shaken out on a canvas-covered platform and all insects removed are cyanided and sent to this State office for determination and statistical purposes. These stations are maintained principally to intercept the alfalfa weevil, which experience has shown is readily carried in camping equipment when it has been used in an area where the insect occurs. It is not necessary that the tourist spread his blankets or pitch his tent in an alfalfa field, for if the blankets have been spread on the ground in the vicinity of an alfalfa weevil infes-

tation during the period in which the adult weevil is active, there are almost certain to be alfalfa weevils present when the automobile reaches our border station. I have found that one of the easiest ways to gather adult alfalfa weevils is to spread a coat or blanket on some growing alfalfa and leave it there for a short period. Upon examining the under side of the article the adult weevils will be readily found, in spite of the fact that it may be practically impossible to find them upon examining the alfalfa itself.

"There are a number of automobile camp grounds in the vicinity of Reno, Nevada, where the weevil is quite prevalent, and while all growing alfalfa has been eradicated from these camps it is an absolute certainty that alfalfa weevil will be found in the blankets of all tourists camping in these grounds, provided they have not used their blankets from the time they leave the camp until they arrive at our border station."

"In shaking out the blankets at the border stations, many insects other than alfalfa weevil are found and these are also sent to this office. These stations are kept open from the early part of June until the middle of October, the time varying according to weather conditions. You will note that 3246 alfalfa weevils were taken from 529 automobiles. While the inspectors make a special effort to gather up and send in all alfalfa weevils shaken from the blankets, the work will not always permit of their gathering up all the other insects, and therefore the list is not an accurate record of all insects taken from automobiles at these stations. It will, however, give some idea of the wide range of insects carried in automobiles, some of them injurious and some of them beneficial."

(To be continued)

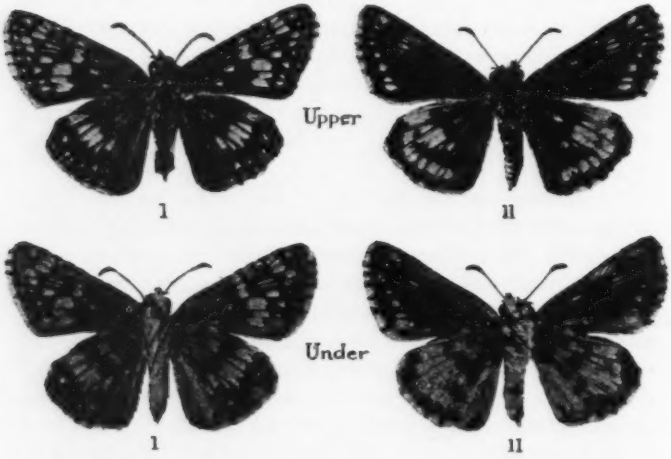
A New "Skipper" Aberration (Lepid.: Hesperiidae).

By J. D. GUNDER, Pasadena, California.

Urbanus tessellata (Scud.), var. **occidentalis** (Skin.), ab. ♀ **skinneri** nov. aberr.

Figures No. 1 illustrate the upper and under sides of a typical female var. *occidentalis* (Skin.) and figures marked No. II show the aberration. These figures are greatly enlarged.

Upper side. The primaries of this aberration are quite melanic except for a single, complete, submarginal row of odd-sized and elongated white spots near outer margin, which spots tend to become larger as they approach both the inner angle and the apex; and a few small flashes of thin white marks at and above extremity of cell. The secondaries are more suffused with white than in normal specimens, having a heavy, squarish row of white spots slightly back from the outer margin, instead of the minute rows normally found adjacent to this margin; this row fuses with the normally placed, but enlarged, discal



area white spotting from the cell extremity to the costal margin.

Under side. Primaries melanic in accord with the upper surface markings, and secondaries with a broad white band all thru discal area, except for two black spots near SM vein; base conglomerate with black spots; and a band or row of confluent black spots on outer margin. Fringes, body and antenna as in the typical species.

Aberrant grade and degree: melanic; final.

Data. Holotype ♀, Expanse 26 mm., (Author's Coll.), Los Angeles, Los Angeles County, California, July 7, 1926.

Named in honor of my friend, the late Dr. Henry Skinner of Philadelphia, to whom I am indebted for many kindnesses.

The North American Nematoproctus (Dipt.: Dolichopodidae).

By M. C. VAN DUZEE, Buffalo, New York.

Table of species, Males.

1. Lower orbital cilia and beard yellow.....*venustus* Wheeler.
— Lower orbital cilia and beard snow white.....2
2. Middle tarsi with last two joints slightly flattened and widened; fore tarsi plain.....*terminalis* Van Duzee.
— Middle tarsi plain; fore tarsi with a fringe of long black hair on one edge of apical half of first and whole of second joint.....*jucundus* new species.

Nematoproctus jucundus new species. ♂: Length 4.5 mm. Face very narrow, the eyes almost touching on the middle of the face. Palpi small, yellow with a few black hairs. Front green, the silvery white pollen of the face extending over it so as to almost conceal the ground color. Lateral and inferior orbital cilia short, snow white, as are also the bristles on lower part of the head. First and second antennal joints yellow, second a little infuscated, first without hair, third brown, slightly yellow at base, the long basal arista brown with very short pubescence.

Dorsum of thorax blue, polished, with green and violet reflections, which form indistinct lines; pleuræ and scutellum more green. First abdominal segment green, second and third yellow, fourth black, apex of abdomen more greenish black; hairs on the dorsum black, on the venter of the first three segments yellow. Hypopygium concealed; it has long black filaments fringed with stiff, short, black hairs, a few at apex longer.

Fore coxæ wholly yellow with short yellow hair and black bristles at tip; middle and hind ones yellow with a black streak. Femora, tibiae and fore and middle tarsi yellow; extreme tips of middle tibiæ, apical fourth of hind tibiæ, last two joints of middle tarsi and whole of posterior ones, black; fore tarsi with the last joints infuscated, first joint fringed above on apical half with black hairs, which become longer toward the tip, second joint fringed with bristle-like hairs, the hairs being of nearly equal length and as long as those at tip of first joint; both joints have a row of little black hairs below, which are as long as width of joint, fourth and fifth joints have this row continued but the hairs are more spine-like and bent at tips; last two joints of middle tarsi not or scarcely widened; joints of fore tarsi as 47-20-14-9-8; of middle ones as 56-28-20-9-8; those of the posterior pair as 42-42-35-11-9. Calypters and halteres yellow, the former with white cilia.

Wings dark grayish; third vein bent backward, parallel with fourth at tip; last section of fifth vein 55-, cross-vein 30-fiftieths of a millimeter long; sixth vein sinuous, not reaching quite to the wing margin.

♀: Face of parallel width, quite wide, silvery white, lower part longer than wide, a little shorter than upper portion, silvery white. Palpi half as long as the face, oval, yellow, with a few black hairs and silvery pollen; front green, the pollen of the face extending over lower half; antennæ as in the male.

Thorax green with blue reflections, sometimes with only a median, blue line; posterior edge of pleuræ yellow. First three abdominal segments and venter of fourth yellow, apical segments green with wide, lateral edges of fourth and very narrow edges of fifth yellow; hairs of abdomen black, except on venter of last two segments, where there are a few yellow hairs.

Coxæ, legs and feet colored as in the male, except that the fore and middle tarsi are more blackened towards their tips. Joints of fore tarsi as 39-40-26-15-11; those of middle ones as 00-29-21-9-8; those of posterior pair as 44-39-27-16-10.

Described from one male and six females which I took in the bed of the old canal at Amity Hall, Benvenue, Pennsylvania, June 4, 1925.

Type and *allotype* in the author's collection.

The Chilean Society of Natural History

A new scientific society was organized recently in Santiago, Chile, with the name The Chilean Society of Natural History (Sociedad chilena de Historia natural). The first officers are as follows: *President,* Professor Carlos E. Porter, Zoologist, Entomologist; *Vice-President,* Professor Francisco Fuentes M., Chief of National Herbarium; *Secretary,* Mr. Gualterio Looser, Honorary Aid in Anthropological Section of National Museum; *Assistant Secretary,* Professor Gilberto Montero, Professor of Natural Sciences; *Directors,* Professor Marcial R. Espinosa, chief of Cryptogamic Botany, National Museum; Professor Miguel R. Machado, Chief of Geological and Mineralogical Section, National Museum; Fr. Flam. Ruiz P., Professor of Natural History, specialist in Apidae. The address of the Society is:—Casilla 2974, Santiago, Chile.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., FEBRUARY, 1927.

Entomology at the "Convocation Week" Meetings, December 27, 1926, to January 1, 1927.

The eighty-third meeting of the American Association for the Advancement of Science and meetings of many affiliated societies were held in Philadelphia during the week noted. Entomological subjects were discussed in the following numbers of papers listed on programs, but not all of these papers were delivered:

Entomological Society of America	38
American Association of Economic Entomologists	102
American Society of Zoologists alone	13
Same, Joint Genetics Section	5
Same, with Ecological Society of America	1
Ecological Society of America alone	1
American Society of Parasitologists	4
American Phytopathological Society	1
Total	167

This total (167) exceeds those of the Kansas City and New Haven meetings of 1925-6 (158) and Washington meeting of 1924-5 (166), but not that of the Cincinnati meeting of 1923-4 (180). This last total included 41 brief papers composing the symposium of that year of the Entomological Society of America. If we deduct this number, the number of papers on the programs of the two entomological societies in 1926-7 is higher than for any of the meetings of the last four years.

The subjects treated in these 167 papers were as follows:

Teaching Entomology	1	Physiology	23
Technique	3	Behavior	2
Cytology	4	Ecology	13
Anatomy	4	Ontogeny	9
		Genetics	3

Parasites of Insects	6	Products	3
Insects affecting Man and Animals	7	Do. Forest and Shade Trees	8
Evolution	1	ii	
Taxonomy	4	Orthoptera	3
Bibliography	1	Isoptera	2
Nomenclature	1	Ephemerida	2
General Subjects	2	Mallophaga	1
General Economic Entomology	20	Anoplura	1
Insecticides and Appliances	23	Thysanoptera	1
Apiculture	10	Homoptera	13
Insects affecting Cereal, Forage and Field Crops	13	Heteroptera	4
Do. Truck Crops	1	Coleoptera	28
Do. Greenhouse Plants	5	Hymenoptera (excl. *Apis*)	6
Do. Fruit	17	*Apis*	12
Do. Household and Stored		Lepidoptera	31
		Diptera (excl. *Drosophila*)	15
		Drosophila	3
		Siphonaptera	1

Many of these figures are duplicated both between sections i and ii and also within each section.

The Entomological Society of America met Tuesday and Wednesday, December 28 and 29, for its twenty-ninth annual meeting, under President Dr. Wm. A. Riley, of the University of Minnesota, and Second Vice President Dr. Annette F. Braun, of Cincinnati. The American Association of Economic Entomologists, including its sections on Plant Quarantine and Inspection and Apiculture, held its thirty-ninth annual meeting December 28 to January 1. President Arthur Gibson, Dominion Entomologist, presided at most of the general sessions.

The annual public address of the Entomological Society was given by Prof. G. H. F. Nuttall, F.R.S., Quick Professor of Biology in the University of Cambridge, England, and Director of the Molteno Institue for Research in Parasitology in the same University. He spoke on "Insect Parasites of Man," describing the characteristics and habits of various mosquitoes, flies, bedbugs, fleas, ticks and lice in relation to human beings. This lecture was given in the lecture hall of The Academy of Natural Sciences, on Tuesday evening, December 28, and was attended by over 300 persons. Following it a smoker was extended to all entomologists by those of Philadelphia.

The banquet of the Economic Entomologists, to which all others were also invited, was given at the Hotel Walton on Thursday evening, December 30, and was participated in by an equal number. The members of the Japanese Beetle Laboratory at Riverton, New Jersey, provided an entertaining and amusing program in which music, comic sketches by local talent and remarks by Doctors W. E. Britton, L. O. Howard, Edith M. Patch, Glenn W. Herrick and W. H. Brittain were delightfully mingled.

The sessions of the two societies were held in Logan Hall of the University of Pennsylvania and were well attended, the Economic Entomologists being frequently present to the number of 250 and more. In a separate room were displayed exhibits of enlarged photographs, physiological apparatus, nomenclature charts, microscopic slides, life histories and a living larva of a remarkable Nemopterid, *Croce*, from the pyramids of Egypt, shown by members of both societies.

Philadelphia bade the Entomologists welcome and we believe that our visitors enjoyed their sojourn among us.

Prof. Cockerell Plans a Trip Abroad.

Prof. T. D. A. Cockerell has been given sabbatical leave of absence from the University of Colorado for the academic year 1927-28 and hopes to carry out the following program: Leaving Boulder in June, he will go to England and after a few days there to Leningrad. Thence he will go to Irkutsk, Siberia, and examine the Ust Balei fossil beds, perhaps on to Chita to see the Trans-Baikal fish and insect shales and in any case visit Lake Baikal and see as much as possible of its peculiar fauna. On the return trip perhaps two weeks in Russian Turkestan. Reach Leningrad about September 20-October 1 and spend three weeks or a month in European Russia, meeting the scientific men and working on his collections at the Russian Academy. Perhaps visit Saratov to see the sunflower work. Back to England about October 25-November 1; a month in England, further work on his collections at the British Museum. About December 1 go to India and Siam, about February 1 to Australia and New Zealand. Home by way of South Sea Islands and California, returning to Boulder about September 1, 1928.

A Case for the English Sparrow as an Insect Destroyer (Lepidoptera).

Altho one usually considers the English sparrow as a bird of no value, more often one of distinct harm because of its aggressive disposition when in association with many of our native birds, there is slowly accumulating a volume of data which indicates that our earlier judgment concerning this bird has been prejudicial or that we are witnessing a marked change in food habit. The following observations are offered in behalf of the English sparrow.

During four years' study of truck crop insects about Chillicothe, Ohio, from 1922 to 1926, I frequently witnessed flocks of this bird industriously moving about the extensive cabbage patches common in that locality. By carefully watching their behavior I felt certain that they were searching for something on the plants. They would hop from plant to plant, often along the rows between the plants, and from time to time pick at some object on the leaves. An examination of the cabbage showed the larvae of the cabbage looper and the imported cabbage worm to be present in large numbers. Could it be that our despised sparrow was eating an equally despised insect? Further observation showed that such was the case.

Remarking to various cabbage growers that the sparrows were becoming somewhat of a benefit, I was surprised to learn that they too had observed this habit from time to time during several years. Thus it seems that, even with an abundance of grain and seeds for food, this bird is slowly becoming a factor of control in the case of the depredations of these two caterpillars.

Since residing in Illinois my attention has been called on two occasions to the English sparrow again functioning in a beneficial role. A resident of Urbana, Ill., whose name I was unable to secure, related having seen a sparrow at work attempting to subdue a large Cecropia caterpillar. Whether the bird had pulled the insect from a tree was not certain, but when observed the bird was busily engaged driving its beak into the luckless worm as it lay on the ground and with bull-dog energy it would then shake its victim. The sparrow was reported to have been somewhat averse at first to attacking the writhing larva, but as the energies of the latter became exhausted the sparrow became more confident and soon was able to carry off its prize.

Mr. J. C. Frankenfeld has also related having observed a similar episode between a sparrow and an almost full grown Cercropia caterpillar.—AUGUST E. MILLER, State Natural History Survey, Urbana, Illinois.

An Indian Entomologist to Visit the United States.

On the 24th of December last, Prof. T. V. Ramakrishna Ayyar, B.A., F.E.S., F.Z.S., an eminent Indian Entomologist, expected to arrive at San Francisco, by the Japanese boat S. S. Siberia Maru. Mr. Ayyar was the first Indian to take up the study of Entomology in his country. He joined the entomological department of the Government of India in 1903 and has been doing entomological work ever since.

In addition to a thorough knowledge of Tropical Entomology in general, Mr. Ayyar has specialised in Hymenoptera, Coccidæ and Thysanoptera, and earned a worldwide reputation.

Though Mr. Ayyar is new to America his publications are quite familiar in entomological circles. He comes here with a view to see at first hand the work done by American entomologists and get into personal touch with them. He will spend a few months in visiting the important Natural History Museums of the country and return to India via England, France, Germany and Italy.

Personal.

Dr. R. H. Painter has been appointed Assistant Professor of Entomology at the Kansas State Agricultural College.

Entomological Literature

COMPILED BY E. T. CRESSON, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers in Heavy-Faced Type refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

Papers of systematic nature will be found in the paragraph beginning with (N). Those pertaining to Neotropical species only will be found in paragraphs beginning with (S). Those containing descriptions of new forms are preceded by an *.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

Papers published in the Entomological News are not listed.

1—Trans., American Ent. Soc., Philadelphia. **8**—Ent. Monthly Mag., London. **12**—Jour. of Economic Ent. **14**—Ent. Zeitschrift, Frankfurt a. M. **18**—Intern. Ent. Zeitschrift, Guben; **23**—Boll., Laboratorio Zool. Gen. e Agr., Portici. **25**—Bull. Soc. Ent. France. **26**—Ent. Anzeiger, Wien. **27**—Bull. Soc. Ent. Italiana. **45**—Zeit. f. Wissenschfl. Insektenbiol., Berlin. **50**—Proc., U. S. National

Museum. **55**—Pan-Pacific Ent., San Francisco. **58**—Ent. Berichten, s'Gravenhage. **69**—Comptes R., Acad. Sci. Paris. **70**—Entomologica Americana, Brooklyn. **71**—Novitates Zoologicae. **77**—Comptes R., Soc. Biologie, Paris. **78**—Bull. Biol. France et Belgique. **101**—Biological Bul., Woods Hole, Mass. **103**—Proc. Zool. Soc. London. **105**—Proc. Biological Soc. Washington. **139**—Bull. Southern Cal. Acad. Sci., Los Angeles. **146**—Anales, Mus. Nac. Hist. Nat., Buenos Aires. **154**—Zool. Anzeiger, Leipzig.

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OBITUARY.

Major JOHN CONEY MOULTON died in London, June 6, 1926. He was born December 11, 1886, and was educated at Eton College and Magdalen College, Oxford. He was Curator of the Sarawak Museum from 1909 to 1914, served in the war, was Director of the Raffles Museum and Library at Singapore 1919-1923 and since 1923 Chief Secretary to the Rajah of Sarawak. His entomological publications include papers on Malayan Cicadidæ, Butterflies of Borneo and Mimicry in Bornean Butterflies. Further details concerning his life are to be found in the *Entomologists' Monthly Magazine* (London) for October, 1926, from which we have made this abstract.